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Appeal Brief

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:
Collier, et al.

Serial No. 09/899,871

Filed: July 6, 2001

For: METHOD AND SYSTEM FOR CLEANING A POLISHING PAD

Group Art Unit: 3723
Examiner: Wilson, L.

Atty. Dkt. No. 5298-05700
PM01016

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October 3, 2003
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Kevin L. Daffer

APPEAL BRIEF

Box AF
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Sir/Madam:

Further to the Notice of Appeal faxed on August 6, 2003, the Appellant presents this Appeal Brief. The Notice of Appeal was filed following receipt of an Advisory Action mailed on July 17, 2003. The Appellant hereby appeals to the Board of Patent Appeals and Interferences a final rejection of claims 11, 12, 14 and 16-22 and respectfully requests that this appeal be considered by the Board.

I. REAL PARTY IN INTEREST

The subject application is owned by Cypress Semiconductor Corporation, a corporation having a place of business at 3901 North First Street, San Jose, CA, 95134.

II. RELATED APPEALS AND INTERFERENCES

No other appeals or interferences are known which would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 1-28 were originally filed in the present application on July 6, 2001. In response to an Office Action mailed November 20, 2002, claims 2, 13, 15, 25 and 26 were canceled and claims 1, 3, 11, 12, 14, 16-18, 23, 24 and 27 were amended. Claims 1, 3-10, 23, 24, 27 and 28 were deemed allowable in the Advisory Action mailed July 17, 2003. Claims 11, 12, 14 and 16-22 stand finally rejected under 35 U.S.C. § 102(e) and are the subject of this appeal. A copy of claims 11, 12, 14 and 16-22, as on appeal, is included in the Appendix hereto.

IV. STATUS OF AMENDMENTS

No amendments to the claims have been filed subsequent to their final rejection. Therefore, the Appendix attached hereto reflects the current state of the claims.

V. SUMMARY OF THE INVENTION

Appellant's claimed invention relates to semiconductor device manufacturing, and more particularly, to a method and spray element for cleaning a polishing pad of a polishing system (Specification -- page 1, lines 3-4). The spray element is adapted to remove matter adhered to a polishing pad by spraying a pressurized fluid upon the polishing pad (Specification -- page 5, lines 8-9). In particular, the spray element may include a plurality of nozzles configured to spray the pressurized fluid (Specification -- page 7, lines 1-2). In some embodiments, the plurality of nozzles may be arranged such that a spray distribution from one of the plurality nozzles overlaps a spray distribution from an adjacent nozzle (Specification -- page 7, lines 2-4). Regardless of the spray distribution of the nozzles, the spray element may further include one or more adjustable shields arranged about the plurality of nozzles (Specification -- page 7, lines 4-5). In particular, the shields may be arranged along the sides of the spray element parallel to the projection of the nozzles (Specification -- page 7, lines 5-6). In some cases, the spray element may be adapted to be positioned within a polishing system (Specification -- page 5, lines 9-

10). For example, the spray element may, in some embodiments, include a mounting structure with which to couple the spray element to the polishing system (Specification -- page 7, lines 6-8). In some cases, the spray element may be adapted to be positioned within the polishing system such that pressurized fluid is dispersed across a region extending across at least half of the width of the polishing pad (Specification -- page 6, lines 28-30).

As noted above, the claimed invention relates to a method for cleaning a polishing pad. The method may include moving the polishing pad relative to a spray element (Specification -- page 7, lines 10-11). In such an embodiment, the spray element and polishing pad may be positioned within a polishing system such that fluid openings of the spray element are directed toward the polishing pad (Specification -- page 7, lines 11-13). In addition, the method may include spraying a pressurized fluid in a pulsating sequence upon the polishing pad while moving the polishing pad (Specification -- page 7, lines 13-15 and page 26, lines 8-9). In some cases, the spraying step may be conducted after polishing one or more semiconductor topographies with the polishing system (Specification -- page 7, lines 21-22). In addition or alternatively, the duration of the spraying step may be sufficient such that the pressurized fluid is dispensed across the entire upper surface of the polishing pad (Specification -- page 7, lines 15-16). Furthermore, the fluid may be sprayed at a sufficient pressure to dislodge the matter adhered to the polishing pad (Specification -- page 7, lines 17-18). For example, in some cases, the fluid may be sprayed at a pressure between approximately 25 psi and approximately 45 psi (Specification -- page 7, lines 18-19). In this manner, the method may further include removing matter adhered to the polishing pad (Specification -- page 7, line 20).

VI. ISSUES

1. Whether claims 11, 12, 14 and 16-22 are unpatentable under 35 U.S.C. § 102(e) by U.S. Patent No. 6,283,840 to Huey (hereinafter referred to as "Huey").

2. Whether claims 11, 12, 14 and 16-22 are unpatentable under 35 U.S.C § 102(e) by U.S. Patent No. 6,284,092 to Manfredi (hereinafter referred to as "Manfredi").

VII. GROUPING OF CLAIMS

Claims 11, 12, 16 and 17 (Group I) stand or fall together.

Claim 14 (Group II) stands or falls alone.

Claims 18-22 (Group III) stand or fall together.

The reasons why the three groups of claims are believed to be separately patentable are explained below in the appropriate parts of the Argument.

VIII. ARGUMENT

The polishing rate performance of polishing systems and the resultant uniformity of wafers polished by polishing systems degrades as matter builds up in the pores and on the upper surface of the polishing pad during the polishing process. The matter may include particles from the polishing fluid or from the polished wafer. As the polishing chemistry is exposed to air during the polishing process, the liquid portion of the fluid evaporates leaving polishing solution particles and wafer particles to clog the pores of the polishing pad. Such clogging restricts the amount of slurry that is able to fill the pores and consequently limits the amount of slurry that may be contained within the vicinity of the polishing pad. In addition, the slurry particles tend to agglomerate forming large masses adhered to the polishing pad. Such an accumulation may be referred to as "glazing" and essentially smoothes out the textured surface of the pad, thereby reducing the effectiveness of the polishing pad. Consequently, the efficiency and performance of a polishing system may be adversely affected by matter adhered to the polishing pad of the system. *See,* Specification: page 3, lines 23-30 and page 4, lines 1-7.

In order to increase the effectiveness of a polishing pad in a polishing system, the polishing pad may be cleaned periodically. Such a cleaning process is typically a sporadic manual process which involves shutting down the polishing system and depositing water upon the pad in an effort to suspend the particles in solution and subsequently wash them away. Unfortunately, such a process typically does not remove all matter from the pad. More specifically, the conventional cleaning process may only be able to suspend matter loosely adhered to the polishing pad. As such, the current cleaning process may not be able to dislodge all matter adhered to the polishing pad. Consequently, the polishing performance and efficiency of the system may degrade more quickly since additional matter may build upon the polishing pad. In addition, such a cleaning process is typically performed when the polishing system is

not in use. Typically, in order to reduce downtime of the polishing system, the cleaning process is performed after a specific number (e.g., 25) of wafers has been processed. In this manner, as the polishing process continues, matter continues to accumulate upon the polishing pad and uniformity from wafer to wafer decreases. Furthermore, since the process is manual, the length and the coverage of the cleaning process may vary. As such, the performance and efficiency of the polishing system may vary, thereby reducing the process capability of the system. *See,* Specification: page 4, lines 9-25.

The invention as recited in claims 11, 12, 14 and 16-22 addresses the above-described problems by providing a method and a spray element for cleaning a polishing pad of a polishing system. The method may include moving the polishing pad relative to a spray element, spraying a pressurized fluid on the polishing pad in a pulsating sequence and removing matter adhered to the polishing pad. In turn, the spray element may be adapted to remove matter adhered to a polishing pad by spraying a pressurized fluid through a plurality of nozzles. In some embodiments, the spray element may include a mounting structure with which to couple the spray element to a polishing system and a plurality of shields arranged about the plurality of nozzles. In this manner, the spray element and method may be used during a polishing process of a wafer or between processing of wafers without causing the polishing system to be shutdown. *See,* Specification: pages 5-8.

ISSUE 1 ARGUMENTS

A. Patentability of Group I Claims 11, 12, 16 and 17

1. Huey does not disclose a spray element which includes one or more adjustable shields arranged about a plurality of nozzles.

Claim 11 recites, in part, "A spray element adapted to be positioned within a polishing system ... wherein the spray element comprises a plurality of nozzles ... and one or more adjustable shields arranged about the plurality of nozzles." Huey teaches a plurality of polishing stations 14 each including a polishing pad 54 and an arm assembly 60 mounted to table top 57 (Huey, Fig.1 and column 3, lines 17-44). Arm assembly 60 includes nozzles 72 and, therefore, may serve as a spray element. Although housing 64 and retainer 78 of arm assembly 60 may be used to enclose streams 76 from nozzles 72, there is no teaching or suggestion within Huey that housing 64 and/or retainer 78 are adjustable independent of assembly arm 60. Consequently, Huey fails to disclose a spray element with adjustable shields as recited in claim 11. As a result, Huey does not anticipate the limitations of claim 11. The standard for

"anticipation" is one of fairly strict identity. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. Of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987), MPEP 2131.

2. The mobility of the arm assembly within Huey does not constitute a spray element with adjustable shields.

The Final Office Action states that Huey teaches a system with arm assembly 60 configured to move and, consequently, teaches a system with adjustable shields. Such a basis for rejection, however, is asserted to be erroneous in light of the scope of the claimed subject matter. In particular, the subject matter of claim 11 is a spray element with adjustable shields, rather than a polishing system with adjustable shields as inferred by the statements made in the Office Action. As such, the limitation of "one or more adjustable shields" in claim 11 specifies the configuration of the claimed spray element, rather than a configuration of a polishing system to have shields which may be repositioned within the system. In particular, the adaptation of the shields to be adjustable is relative to the components of the claimed spray element rather than the polishing system in which the spray element is adapted to be positioned. Consequently, the mobility of the spray element within Huey does not constitute the limitation of the claimed spray element to have adjustable shields.

3. There is no motivation within Huey to teach or suggest a spray element with one or more adjustable shields arranged about a plurality of nozzles.

Huey specifically teaches interposing retainer 78 between assembly housing 64 and polishing pad 54 to form "... a dam to retain slurry and rinse water within a reservoir formed by the retainer and pad." (Huey, column 4, lines 42-43). As such, there is no motivation for assembly housing 64 to be adjustable since raising the sidewalls of assembly housing 64 would prevent the formation of a dam on polishing pad 54. If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) MPEP 2143.01. Consequently, claim 11 is asserted to be patentably distinct from Huey.

Conclusion

As explained in Arguments 1-3 above, at least some limitations of independent claim 11, are not disclosed by Huey. Furthermore, there is no motivation within Huey to teach the limitations of claim 11. Moreover, the basis for rejection in the Final Office Action is asserted to be erroneous. Therefore, for at least these reasons, independent claim 11 is asserted to be patentably distinct over Huey. Since claims 12, 16 and 17 are dependent from claim 11, claims 12, 16 and 17 are asserted to be patentably distinct over Huey for at least the same reasons as that claim. Accordingly, the § 102(e) rejection of Group I claims 11, 12, 16 and 17 in light of Huey is asserted to be erroneous.

B. Patentability of Group II Claim 14

Because claim 14 of Group II is dependent from claim 11 of Group I, the arguments presented above for patentability of claim 11 apply equally to claim 14, and are herein incorporated by reference. Claim 14 specifies the spray distribution from one nozzle of the claimed spray element overlaps a spray distribution from an adjacent nozzle of the claimed spray element. This limitation makes claim 14 separately patentable over Huey, as described in more detail below.

1. Huey does not disclose a spray element with a nozzle having a spray distribution which overlaps a spray distribution of an adjacent nozzle.

Claim 14 recites, "The spray element of claim 11, wherein a spray distribution from one of said plurality nozzles overlaps a spray distribution from an adjacent nozzle." As shown in Fig. 3 of Huey, nozzles 72 are sufficiently spaced apart such that the spray distributions from the nozzles do not overlap. Consequently, Huey does not anticipate the limitations of claim 14. The standard for "anticipation" is one of fairly strict identity. The identical invention must be shown in as complete detail as is contained in the ... claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989) MPEP 2131.

2. There is no motivation to modify Huey to provide a spray element with a nozzle having a spray distribution which overlaps a spray distribution of an adjacent nozzle.

As noted above, Huey fails to disclose a spray element with a nozzle having a spray distribution which overlaps a spray distribution of an adjacent nozzle. In fact, Huey fails to even imply a spray element with such a configuration. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed.Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); and, MPEP 2143.01. Without some teaching or suggestion to teach the limitations of claim 14, there is no motivation within claim 14 to teach the limitations of the presently claimed case. Consequently, claim 14 is asserted to be patentably distinct over Huey.

Conclusion

As explained in Arguments 1 and 2 above, at least some limitations of Group II claim 14 are not taught or suggested by Huey. In addition, there is no motivation within Huey to teach the limitations of claim 14. For at least these reasons, claim 14 is asserted to be patentably distinct over Huey and the § 102(e) rejection of Group II claim 14 in light of Huey is asserted to be erroneous.

C. Patentability of Group III Claims 18-22

1. Huey does not disclose a method for cleaning a polishing pad which includes spraying a pressurized fluid in a pulsating sequence upon the polishing pad.

Claim 18 recites, in part, "A method for cleaning a polishing pad, comprising ... spraying a pressurized fluid in a pulsating sequence from the spray element upon the polishing pad ... ." There is no teaching or suggestion within Huey of spraying a pressurized fluid in a pulsating sequence upon polishing pad 54. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. Of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987), MPEP 2131. As such, Huey does not anticipate the limitations of claim 18.

2. There is no motivation within Huey to teach or suggest a method which includes spraying a pressurized fluid in a pulsating sequence upon a polishing pad.

Not only does Huey not teach or suggest spraying a pressurized fluid in a pulsating sequence, Huey fails to disclose any adaptations for nozzles 72 and/or arm assembly 60 which would produce such a spraying sequence. Consequently, there is no teaching, suggestion or motivation within Huey to produce the method recited in claim 18. To establish a *prima facie* obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974); MPEP 2143.03.

3. The presumption made in the Office Action that pulsating a pressurized fluid upon a polishing pad is a natural use of the claimed apparatus is not a proper basis for rejection for the claimed method.

The basis for the rejection of claim 18 in the Final Office Action is that the claimed method "... is merely the natural use of the claimed apparatus." (Office Action, page 2). Applicant is unaware of any legal precedent that bars claims from being directed at a method of using an apparatus, presuming the claimed process steps are novel and are unobvious. As noted above, Huey neither teaches nor suggests spraying a pressurized fluid in a pulsating sequence and, therefore, provides no teaching or suggestion that such a method is not novel or unobvious. As such, even if the claimed method is a natural use of the claimed spray element, such reasoning cannot be used as a basis for the rejection of the claimed method.

4. Pulsating a pressurized fluid upon a polishing pad is not necessarily a natural use of the apparatus of the presently claimed case.

As noted above, the Final Office Action states the claimed method "... is merely the natural use of the claimed apparatus." (Office Action, pages 2). Such a statement is traversed, however. In particular, pulsating a pressurized fluid upon a polishing pad is not necessarily a natural use of the claimed spray element. A "natural" or expected use of a spray element may be to spray a fluid. The manner in which the fluid is sprayed, however, may depend upon the application for which is used and, therefore, may not necessarily be "natural" or inherent. For example, the Specification teaches spraying a pressurized fluid in a pulsating sequence may be advantageous "...so that the fluid dispersed from the spray element may not dilute the slurry used to polish the topography." (Specification, page 26, lines 3-4). Without some teaching or suggestion of spraying fluid in a pulsating sequence for such a purpose or any other purpose, there is motivation to use a spray element in the manner recited in claim 18. As noted

above, Huey fails to teach or suggest spraying a fluid in a pulsating sequence. As such, Huey fails to provide any motivation to teach or suggest a method including such a step.

5. Pulsating a pressurized fluid upon a polishing pad is not a matter of operator choice.

The Final Office Action states "The limitation of having [a] pulsating sequence would be a matter of intended use because the user can manually or automatically cause the spray to pulsate as a matter of operator choice." (Office Action, pages 2). As noted above, the Specification specifically teaches spraying a pressurized fluid in a pulsating sequence may be advantageous "...so that the fluid dispersed from the spray element may not dilute the slurry used to polish the topography." (Specification, page 26, lines 3-4). Consequently, pulsating a pressurized fluid may not simply be a matter of operator choice, but offers a manner with which to enhance the operation of the polishing system. Furthermore, in order to deem a limitation of a method claim to be a matter of operator choice, some recognition of and/or motivation to use the method must be present in a cited reference. The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device. *Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984); MPEP 2144.04. As noted above, Huey fails to teach or suggest spraying a pressurized fluid upon a polishing pad in a pulsating sequence. Furthermore, Huey fails to teach or suggest a system in which the flow sequence from a spray element may be altered by an operator. As such, Huey fails to provide any teaching or suggestion that spraying a fluid in such a manner is possible with the apparatus claimed therein, much less a matter of operator choice. As such, the limitation of spraying a pressurized fluid upon a polishing pad, as recited in claim 18, cannot be a matter of operator choice in light of the teachings of Huey.

Conclusion

As explained in Arguments 1-5 above, at least some limitations of Group III claim 18 is not taught or suggested by Huey. In addition, there is no motivation within Huey to teach the limitations of claim 18. Furthermore, the presumption made in the Final Office Action that pulsating a pressurized fluid upon a polishing pad is a natural use of the claimed apparatus is traversed and cannot be used as a basis for rejection for the claimed method. Moreover, the limitation of pulsating a pressurized fluid upon

a polishing pad in claim 18 is not a matter of operator choice. For at least these reasons, claim 18 is asserted to be patentably distinct over Huey. Since claims 19-22 are dependent from claim 18, claims 19-22 are asserted to be patentably distinct over Huey for at least the same reasons as that claim. Accordingly, the § 102(e) rejection of Group III claims 18-22 in light of Huey is asserted to be erroneous.

ISSUE 2 ARGUMENTS

A. Patentability of Group I Claims 11, 12, 16 and 17

1. Manfredi does not disclose a spray element which includes one or more adjustable shields arranged about a plurality of nozzles.

This is the limitation of claim 11 argued above in reference to the patentability of Group I claims 11, 12, 16 and 17 with regard to Issue 1. Manfredi teaches slurry dispenser device 12 having curtain 34 "... employed around the periphery of the dispenser 24 to contain the atomized slurry and prevent loss of slurry and/or misting in the work area." (Manfredi, column 6, lines 58-60). Manfredi, however, does not teach or suggest a spray element with adjustable shields as recited in the presently claimed case. In particular, Manfredi does not teach or suggest curtain 34 is adjustable independent of dispenser 24. Consequently, Manfredi fails to anticipate the limitations of claim 11. The standard for "anticipation" is one of fairly strict identity. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. Of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987), MPEP 2131.

2. The mobility of the slurry dispenser taught by Manfredi does not constitute a spray element with adjustable shields.

Similar to arm assembly 60 taught in Huey, Manfredi teaches curtain 34 and dispenser 24 as a unitary body within dispenser device 12. As such, curtain 34 and dispenser 24 move together relative to polishing pad 16. There is no teaching or suggestion that curtain 34 is adjustable relative to dispenser 24 or any other component of dispenser device 12 for that matter. The Office Action states that Manfredi teaches a spray element configured to move and, consequently, teaches a system with adjustable shields. As in the argument presented above in reference to the patentability of Group I claims 11, 12, 16 and 17 with regard to Issue 1, such a basis for rejection is asserted to be erroneous in light of the scope of the claimed subject matter. In particular, the subject matter of claim 11 is a spray element with adjustable shields, rather than a polishing system with adjustable shields as inferred by the statements made in the

Final Office Action. More specifically, the adaptation of the claimed shields to be adjustable is relative to the components of the spray element rather than the polishing system in which the spray element is adapted to be positioned. Consequently, the mobility of the slurry dispenser within Manfredi does not constitute the limitation of the claimed spray element to have adjustable shields.

3. There is no motivation within Manfredi to teach or suggest a spray element with one or more adjustable shields arranged about a plurality of nozzles.

As noted above, Manfredi uses curtain 34 to contain the atomized slurry generated by slurry dispenser device 12. Manfredi specifically teaches that "The slurry is forced under pressure from the dispenser means 24 in the form of a stream or more preferably drops or droplets 27 from spaced apart openings 31 in tube 32 as shown in Fig. 3. The chemical slurry drops 27 and the air curtain 28 meet preferably at or near the pad surface and form an atomized chemical spray 29 which impinges on the surface 16 of pad 15. " (Manfredi, column 6, lines 33-39). As such, Manfredi teaches the position of curtain 34 "... extend[ing] to slightly above the pad surface." (Manfredi, column 6, line 62) such that the atomized spray may be contained. Since Manfredi prefers to maintain atomized chemical spray 29 within close proximity of pad 15, there is no motivation to adjust the position of curtain 34. In fact, adjusting the position of curtain 34 may undesirably cause atomized spray 29 to disperse across a large area of polishing pad 15. Such a dispersion of the spray may reduce the coating of slurry on the polishing pad, negatively affecting the polishing rate of the system. If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) MPEP 2143.01.

Conclusion

As explained in Arguments 1-3 above, at least some limitations of independent claim 11, are not disclosed by Manfredi. Furthermore, there is no teaching, suggestion or motivation within Manfredi to teach the limitations of claim 11. In addition, the basis for rejection in the Office Action is asserted to be improper in light of the claimed subject matter. Therefore, for at least these reasons, independent claim 11 is asserted to be patentably distinct over Manfredi. Since claims 12, 16 and 17 are dependent from claim 11, claims 12, 16 and 17 are asserted to be patentably distinct over Manfredi for at least the same reasons as that claim. Accordingly, the § 102(e) rejection of Group I claims 11, 12, 16 and 17 in light of Manfredi is asserted to be erroneous.

B. Patentability of Group II Claim 14

Because claim 14 of Group II is dependent from claim 11 of Group I, the arguments presented above for patentability of claim 11 apply equally to claim 14, and are herein incorporated by reference. Claim 14 specifies the spray distribution from one nozzle of the claimed spray element overlaps a spray distribution from an adjacent nozzle of the claimed spray element. This limitation makes claim 14 separately patentable over Manfredi, as described in more detail below.

1. Manfredi does not disclose a spray element with a nozzle having a spray distribution which overlaps a spray distribution of an adjacent nozzle.

This is the limitation of claim 14 argued above in reference to the patentability of Group II claim 14 with regard to Issue 1. In Fig. 1 Manfredi illustrates a stream of slurry droplets 27 dispensing from slurry dispenser device 12. Manfredi specifically teaches that the slurry "... is dropped downward, preferably substantially transverse to the polishing pad surface ..." (Manfredi, column 7, lines 21-23). There is no teaching or suggestion of spraying the slurry at an angle less than 90° relative to the polishing pad, much less spraying the slurry such that the distribution from openings 31 overlap. As such, Manfredi fails to anticipate the limitations of claim 14. The standard for "anticipation" is one of fairly strict identity. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. Of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987), MPEP 2131.

2. There is no motivation to modify Manfredi to provide a spray element with a nozzle having a spray distribution which overlaps a spray distribution of an adjacent nozzle.

As noted above, Manfredi fails to disclose a spray element which is configured to cause spray distributions to overlap. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed.Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); and, MPEP 2143.01. Without some teaching or suggestion to create a spray element with such a configuration, there is no motivation within claim 14 to teach the limitations of the presently claimed case. Consequently, claim 14 is asserted to be patentably distinct over Manfredi.

Conclusion

As explained in Arguments 1 and 2 above, at least some limitations of Group II claim 14 are not taught or suggested by Manfredi. In addition, there is no motivation within Manfredi to teach the limitations of claim 14. For at least these reasons, claim 14 is asserted to be patentably distinct over Manfredi and the § 102(e) rejection of Group II claim 14 in light of Manfredi is asserted to be erroneous.

C. Patentability of Group III Claims 18-22

1. Manfredi does not disclose a method for cleaning a polishing pad which includes spraying a pressurized fluid in a pulsating sequence upon the polishing pad.

This is the limitation of claim 18 argued above in reference to the patentability of Group II claims 18-22 with regard to Issue 1. There is no teaching or suggestion within Manfredi of spraying a pressurized fluid in a pulsating sequence upon polishing pad 16. As such, Manfredi does not disclose the limitations of claim 18. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. Of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987), MPEP 2131.

2. There is no motivation within Manfredi to teach or suggest a method which includes spraying a pressurized fluid in a pulsating sequence upon a polishing pad.

Not only does Manfredi not teach or suggest spraying a pressurized fluid in a pulsating sequence, Manfredi fails to disclose any adaptations for spray dispenser 12 which would produce such pulsating sequence. To establish a *prima facie* obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974); MPEP 2143.03. Consequently, there is no teaching, suggestion or motivation within Manfredi to produce the method cited in claim 18.

3. The presumption made in the Office Action that pulsating a pressurized fluid upon a polishing pad is a natural use of the claimed apparatus is not a proper basis for rejection for the claimed method.

Similar to the basis for the 102(e) rejection of claim 18 in light of Huey, the basis for the rejection of claim 18 in light of Manfredi in the Final Office Action is that the claimed method "... is merely the natural use of the claimed apparatus." (Office Action, pages 2). As noted above, Applicant is unaware of any legal precedent that bars claims from being directed at a method of using an apparatus,

presuming the claimed process steps are novel and are unobvious. Furthermore, Manfredi neither teaches or suggests spraying a pressurized fluid in a pulsating sequence and, therefore, provides no teaching or suggestion that such a method is not novel or unobvious. As such, even if the claimed method is a natural use of the claimed spray element, the basis for the rejection of the claimed method is not proper.

4. Pulsating a pressurized fluid upon a polishing pad is not necessarily a natural use of the apparatus of the presently claimed case.

As noted above, the Final Office Action states the claimed method "... is merely the natural use of the claimed apparatus." (Office Action, pages 2). Such a statement is traversed, however. In particular, pulsating a pressurized fluid upon a polishing pad is not necessarily a natural use of the claimed spray element. A "natural" or expected use of a spray element may be to spray a fluid, but the manner in which the fluid is sprayed may depend upon the application for which is used and therefore, may not necessarily be "natural" or inherent. For example, the Specification teaches spraying a pressurized fluid in a pulsating sequence may be advantageous "...so that the fluid dispersed from the spray element may not dilute the slurry used to polish the topography." (Specification, page 26, lines 3-4). Without any teaching or suggestion of spraying fluid in a pulsating sequence for such a purpose or any other purpose, there is motivation to use the claimed apparatus in the manner recited in claim 18. As noted above, Manfredi fails to teach or suggestion spraying a fluid in a pulsating sequence. As such, Manfredi fails to provide any motivation to support that the claimed apparatus may be used in such a manner.

5. Pulsating a pressurized fluid upon a polishing pad is not a matter of operator choice.

The Final Office Action states "The limitation of having [a] pulsating sequence would be a matter of intended use because the user can manually or automatically cause the spray to pulsate as a matter of operator choice." (Office Action, pages 2). As noted above, the Specification specifically teaches spraying a pressurized fluid in a pulsating sequence may be advantageous "...so that the fluid dispersed from the spray element may not dilute the slurry used to polish the topography." (Specification, page 26, lines 3-4). Consequently, pulsating a pressurized fluid may not simply be a matter of operator choice, but offers a manner with which to enhance the operation of the polishing system. Furthermore, in order to deem a limitation of a method claim to be a matter of operator choice, some recognition of and/or motivation to use the method must be present in a cited reference. The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not

by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device. *Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984); MPEP 2144.04. As noted above, Manfredi fails to teach or suggest spraying a pressurized fluid upon a polishing pad in a pulsating sequence. Furthermore, Manfredi fails to teach or suggest a system in which the flow sequence from a spray element may be altered by an operator. As such, Manfredi fails to provide any teaching or suggestion that spraying a fluid in such a manner is possible with the apparatus claimed therein, much less a matter of operator choice. As such, the limitation of spraying a pressurized fluid upon a polishing pad, as recited in claim 18, cannot be a matter of operator choice in light of the teachings of Manfredi.

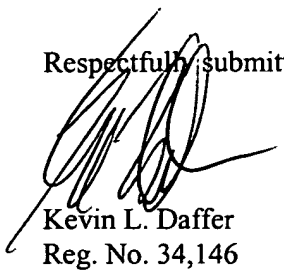
Conclusion

As explained in Arguments 1-5 above, at least some limitations of Group III claim 18 is not taught or suggested by Manfredi. In addition, there is no motivation within Manfredi to teach the limitations of claim 18. Furthermore, the presumption made in the Final Office Action that pulsating a pressurized fluid upon a polishing pad is a natural use of the claimed apparatus is traversed and is asserted to be an improper basis for rejection for the claimed method. Moreover, the limitation of pulsating a pressurized fluid upon a polishing pad in claim 18 is not a matter of operator choice. For at least these reasons, claim 18 is asserted to be patentably distinct over Manfredi. Since claims 19-22 are dependent from claim 18, claims 19-22 are asserted to be patentably distinct over Manfredi for at least the same reasons as that claim. Accordingly, the § 102(e) rejection of Group III claims 18-22 in light of Manfredi is asserted to be erroneous.

IX. CONCLUSION

For the foregoing reasons, it is submitted that the Examiner's rejection of claims 11, 12, 14 and 16-22 was erroneous, and reversal of his decision is respectfully requested.

Respectfully submitted,



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X. APPENDIX

The present claims on appeal are as follows.

11. A spray element adapted to be positioned within a polishing system and further adapted to remove matter adhered to a polishing pad of the system by spraying a pressurized fluid upon the polishing pad, wherein the spray element comprises a plurality of nozzles configured to spray the pressurized fluid and one or more adjustable shields arranged about the plurality of nozzles.

12. The spray element of claim 11, wherein the spray element is adapted to be positioned within the polishing system such that the pressurized fluid is dispersed across a region extending across at least half of the width of the polishing pad.

14. The spray element of claim 11, wherein a spray distribution from one of said plurality nozzles overlaps a spray distribution from an adjacent nozzle.

16. The spray element of claim 11, wherein said shields are arranged along the sides of the spray element parallel to the projection of the nozzles.

17. The spray element of claim 11, comprising a mounting structure with which to couple the spray element to the polishing system.

18. A method for cleaning a polishing pad, comprising:

moving the polishing pad relative to a spray element, wherein the spray element and polishing pad are positioned within a polishing system such that fluid openings of the spray element are positioned toward the polishing pad;

spraying a pressurized fluid in a pulsating sequence from the spray element upon the polishing pad during said moving; and

removing matter adhered to the polishing pad.

19. The method of claim 18, wherein said spraying is conducted after polishing one or more semiconductor topographies with the polishing system.

20. The method of claim 18, wherein the duration of said spraying is sufficient such that the pressurized fluid is dispensed across the entire upper surface of the polishing pad.

21. The method of claim 18, wherein said spraying comprises spraying the fluid at a sufficient pressure to dislodge the matter adhered to the polishing pad.

22. The method of claim 18, wherein said spraying comprises spraying the fluid at a pressure between approximately 25 psi and approximately 45 psi.